AN EVALUATION OF AMBULANCE CROSS-STAFFING

BY U.S. MARINE CORPS FIRE DEPARTMENTS

STRATEGIC MANAGEMENT OF CHANGE

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ABSTRACT

A number of U.S. Marine Corps (USMC) fire departments have implemented an ambulance cross-staffing policy that staffs the ambulances utilizing existing engine company personnel. While anecdotal information suggests the program has worked well, the problem prompting this research was the lack of an internal evaluation of the ambulance cross-staffing policy. Without the evaluation, the USMC cannot determine if the fire and emergency service personnel have accepted the policy change.

The purpose of this research was to evaluate the ambulance cross-staffing policy and determine if the policy was compromising other emergency service missions or increasing the safety risk to the fire and emergency service personnel. Evaluative research methods were used to answer the following research questions:

1. Does the literature support cross-staffing ambulances using existing fire department personnel?

2. Has ambulance cross-staffing affected the fire department's ability to deliver other emergency services? If so, what is the magnitude?

3. Has ambulance cross-staffing compromised fire department personal safety during emergency operations? If so, what is the risk?

4. Should the USMC revise the fire department ambulance cross-staffing policy?

The literature review indicated that few career fire departments were utilizing an ambulance cross-staffing program. However, interviews conducted within the U.S. military services indicated there was support for an ambulance cross-staffing program. A survey was conducted of the fire and emergency service personnel at four USMC fire departments to obtain information on the existing ambulance cross-staffing policy.

The results from the survey were mixed. A majority of the personnel felt ambulance cross-staffing did not compromise the other emergency service missions or their personal safety. However, a number of concerns were raised regarding the affect on mission and personal safety and a majority of the personnel indicated the ambulance cross-staffing policy should be revised. A significant relationship was found between the experience of the personnel and their concern for personal safety, mission compromise and the recommendation to revise the cross-staffing policy.

Recommendations included verification that an ambulance cross-staffing policy can be successfully implemented; requiring risk assessments before implementing an ambulance cross-staffing program; additional monitoring of the program at two fire departments; reevaluation of the program at one fire department; developing standard criteria for ambulance cross-staffing; and additional research on the cross-staffing policy revisions.

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INTRODUCTION

In 1992, the USMC formulated a policy permitting USMC fire departments to operate and staff the U.S. Navy ambulances. The policy was intended to upgrade the emergency medical service (EMS) delivery at USMC installations and increase the effectiveness of the USMC fire departments. Unfortunately, due to the continuing U.S. Department of Defense (DoD) personnel downsizing and reductions in support appropriations, adding additional personnel to staff the ambulances was generally not feasible. As a result of the policy change, which was formally established in 1997, six USMC fire departments have cross-staffed the U.S. Navy ambulances. Anecdotal information from USMC Installation Commanders, Fire Chiefs and U.S. Navy Emergency Physicians indicates the policy change has significantly improved the EMS delivery.

While the results of the policy change appear positive, there has never been an internal evaluation of the policy to determine if the fire and emergency service personnel within the USMC have accepted the change. Thus, the problem prompting this research was the lack of an internal evaluation of the cross-staffing policy change. Specifically, has ambulance cross-staffing compromised the mission of the USMC fire departments and increased the safety risk to the fire and emergency service personnel?

In formally adopting the ambulance policy, the Commandant of the Marine Corps clearly stated his goals for cross-staffing program. "Fire departments may provide ambulance services where it will increase the emergency medical service system effectiveness and will not seriously compromise the other fire and emergency service missions " (Commandant of the Marine Corps, 1997, p.2-12). The purpose of this research was to determine if ambulance cross-staffing was compromising the other fire

and emergency service missions and increasing the safety risk to the fire and emergency service personnel.

This research used an evaluative research methodology and focused on an internal evaluation of the cross-staffing policy by the fire and emergency service personnel who provide the emergency services. A survey was utilized to assess the acceptance of the ambulance cross-staffing policy at four USMC fire departments. The research addressed the following questions:

1. Does the literature support cross-staffing ambulances using existing fire department personnel?

2. Has ambulance cross-staffing affected the fire department's ability to deliver other emergency services? If so, what is the magnitude?

3. Has ambulance cross-staffing compromised fire department personal safety during emergency operations? If so, what is the risk?

4. Should the USMC revise the fire department ambulance cross-staffing policy?

BACKGROUND AND SIGNIFICANCE

In the mid-1980s, the Commandant of the Marine Corps initiated a project to incorporate first responder EMS within the USMC fire departments. Prior to this time, the U.S. Navy, through their medical treatment facilities (MTFs), was the sole provider of EMS on USMC installations. The first responder EMS project focused on improving the quality of life on USMC installations by using emergency medical technician (EMT) trained fire and emergency service personnel to provide non-transport EMS. The program was based on the civilian sector first responder model, which recognized the benefits to the public through a fire service based EMS program. As a result of the project, the

USMC was the first U.S. military service to adopt a standardized fire service EMT program (Commandant of the Marine Corps, 1986).

By the early 1990s, the first responder EMS program was fully implemented in the USMC fire departments. Fire department personnel provided basic life support functions from engine companies and the U.S. Navy MTFs provided the ambulance transport services. However, there was increasing concern from many USMC fire departments about the U.S. Navy MTF's ability to provide an effective ambulance transport program. Additionally, the Commandant of the Marine Corps was pushing USMC fire departments to expand their services. Such action was deemed necessary to address the continuing decline in fire suppression activities and the cost reductions in U.S. military support functions. As a result, the Commandant of the Marine Corps (1992) proposed a policy change to permit USMC fire departments to provide the ambulance transport functions.

The U.S. Marine Corps Air Ground Combat Center (MCAGCC) Fire Department at Twentynine Palms was the first department to propose a Memorandum of Understanding (MOU) with a U.S. Navy MTF to provide ambulance transport. In their initial discussions on the MOU, the U.S. Navy advised they could not provide any personnel to operate the ambulance. This was a result of the continuing downsizing of U.S. Navy Corpsman at the MTF and the reduction in operating expenses for MTF. As a result, the MCAGCC Fire Department proposed cross-staffing the ambulances utilizing existing engine company personnel. The MOU (U.S. Marine Corps Air Ground Combat Center, 1993) was put in place on a pilot program basis in May 1993 and finalized in October 1994.

By 1997, six USMC fire departments were providing ambulance transport functions utilizing the cross-staffing procedures developed by the MCAGCC Fire Department. USMC Installation Commanders, Fire Chiefs and U.S. Navy Hospital Emergency Physicians often praised the fire

departments for the improvements in EMS and they did not express concerns regarding reductions in fire department capabilities. As a result, the Commandant of the Marine Corps (1997) officially adopted the policy permitting fire departments to cross-staff ambulances.

In August of 1997, the DoD Fire and Emergency Services Quality Working Group released the 1998-2002 DoD Fire and Emergency Service Strategic Plan (U.S. Department of Defense [DoD], 1997). One of the critical issues identified in the Strategic Plan was EMS on military installations. As a result, a goal was established to transfer all EMS functions to DoD fire departments. The transfer was viewed as a means to provide an enhanced emergency response capability, reduction in operating costs and a more efficient organizational structure.

Also in 1997, the DoD Fire and Emergency Services Quality Working Group chartered an Ad Hoc Committee to review EMS within all the military services. The Committee Final Report (DoD, 1998b) clearly expressed the concerns with EMS in the U.S. military services.

" The Ad Hoc Committee is of the opinion that EMS at military installations is deficient by most local, regional, state and nationally recommended standards of performance and clinic care. Limited data suggests that significant, preventable untoward outcomes, including unnecessary deaths, have occurred among patients who have engaged military EMS systems, and indicate systemic deficiencies in policy, supervision, training and/or equipment" (DoD, 1998b, p.3). The Committee recommended DoD fire departments as the most suitable agency to provide non-transport EMS and often as the best provider of transportation services. Further, the Committee concluded that DoD fire departments could absorb EMS transport services at many installations with minimal increases in total staffing.

With six USMC fire departments already providing ambulance transport services through cross-staffing and the possibility for more based on the Strategic Plan goal and the Ad Hoc Committee

recommendations, an evaluation of the cross-staffing policy change was warranted. A critical part of the evaluation was the acceptance of the cross-staffing policy by the fire and emergency service personnel who provide the services. If the USMC was to successfully institutionalize ambulance transport utilizing a cross-staffing approach, the policy must be incorporated into the new behaviors of the fire and emergency service personnel. Conversely, if there was continuing resistance to the new policy, a modification to the change approach would be necessary.

This paper was prepared to satisfy the applied research requirements associated with the Strategic Management of Change course at the National Fire Academy. The research relates to the Evaluation/Institutionalism phase of the Change Management Model (U.S. Fire Administration, 1996). Through surveys of the USMC fire and emergency service personnel, the research seeks to evaluate the ambulance cross-staffing change implementation and any revisions necessary to institutionalize the policy.

The results of the research have tremendous significance to the USMC fire departments in terms of how the ambulance cross-staffing policy will be implemented in the future. The research provides the basis for modification, if any, to the existing policy based on the experiences of the personnel who cross-staff ambulances in the USMC. The research may also assist other DoD fire departments in designing an EMS transport system that incorporates an ambulance cross-staffing policy.

LITERATURE REVIEW

Surprisingly, very little literature was found relating to ambulance cross-staffing during the literature review. For example, a search for ambulance cross-staffing at the Learning Resource Center, National Emergency Training Center produced no matches in August 1998. Therefore, the literature review was expanded to include fire department based ambulance services that utilized dual role, cross-

trained fire and emergency service personnel. The literature review focused on fire department based ambulance services both within and outside of the U.S. military services, the factors that affected ambulance cross-staffing in the USMC and the position of the other U.S. military services and the U.S. Coast Guard regarding ambulance cross-staffing.

Fire Department Based Ambulance Services

One of the earliest reports that addressed fire department based ambulance service was the Advanced Coronary Treatment Foundation's 1980 Fire Service EMS Program Management Guide. The guide identified 26 different fire service EMS profiles of which eight specifically addressed dual role, cross-trained career fire fighter EMTs or paramedics serving on transporting ambulance vehicles. The guide indicated continuity in care was the primary benefit of fire department based ambulance transport while system abuse and increased call volume were major concerns. The guide indicated average out of service time was significantly greater in a transport profile, however there was no documentation that fire suppression services were compromised. The guide did not identify an ambulance cross-staffing profile, however it did highlight the medic company profile in which four person crews responded as a company to either fires on an engine or to EMS emergencies on an ambulance.

In 1987 through 1995, the International Association of Fire Chiefs produced a number of reports that addressed EMS management in the fire service. The 1991 report surveyed 207 fire departments that provided some type of EMS function. Of the 111 who responded to the questionnaire, 73 indicated they provided ambulance transport services at the basic or advanced life support level. While the survey did not address ambulance cross-staffing, the survey did identify training and paramedic retention as the most common problems associated with fire department EMS.

The fourth International Association of Fire Chiefs EMS management report (circa 1994) suggested a high demand for EMS services could justify higher fire fighter staffing, based on realistic and field demonstrated appraisal of staffing requirements required for EMS incidents. While there has been a great deal of controversy defining the number of fire fighters needed to safely and effectively conduct interior structural fire fighting, the report suggests medical emergencies do not share such ambiguity. For cardiac arrest, a minimum of four personnel was required to effectively administer treatment.

The latest International Association of Fire Chiefs EMS management report (1995) included an unscientific survey of 420 fire departments and their role in EMS. Over 60 percent of the respondents indicated their fire department transports patients and 53 percent of the respondents indicated they depended on EMS to help justify their current staffing levels. The report stated that a major percentage of respondents felt loss of EMS duties would result in major cuts to fire department budgets and staffing and decreased level of EMS to the public.

In 1996, Dittmar reported on 14 fire departments that successfully provided ambulance transport services. The profiles consisted of dual role, cross-trained EMTs or paramedics responding on fire department ambulances. Advantages cited were continuity of care and public support for the fire department. "The public tends to identify the entire emergency medical systems with the agency that transports, just as the public identifies the fire department with the community's EMS when the fire apparatus is the first responder." (Dittmar, 1996, p. 122). Increased call volume, out of service time and difficulties in obtaining funding to start-up the transport service were identified as disadvantages. Dittmar cited volume of calls as a major consideration in determining whether fire departments should transport.

Keller (1993) reported the success of fire department based ambulance transportation was based on the ability to utilize cross-trained personnel. Because patient transport is expensive, especially in terms of labor, using cross-trained personnel reduces the number of additional staff need to operate the ambulance.

Thorp (1993) reported on a number of fire departments and their experience with advanced life support engine companies. He cited the Madison, WI program in which two-person engine companies and two-person ambulance companies operated out of the same fire station. Depending on the type of call, the entire crew took either the ambulance or the engine. Thorp also cited the Lees Summit, MO program where some two-person engines respond with an ambulance rather than on their own.

In 1997, the City of San Diego, Fire & Life Safety Services included ambulance cross-staffing in the redesign of their EMS system. As part of the EMS ambulance operation, four ambulances were designated as transport capable engine companies or two piece companies. The ambulances were staffed with existing engine company personnel.

The City of San Francisco originally proposed a basic life support ambulance tier in their report on Optimizing the Configuration of San Francisco's EMS (International Association of Fire Chiefs, 1997). However, the Steering Committee dropped the basic life support tier in part due to fire suppression concerns. The Committee was concerned it would violate the union's agreement concerning fire suppression staffing if existing EMT/fire fighters staffed the ambulances and were not replaced.

The Federal Fire Department in San Diego, CA cross-staffed their combination pumper-ambulance from an existing engine company when introduced in 1996 (W. J. Egidi, personal communication, January 28, 1999). Due to their good fire prevention program, they have not seen a reduction in their

other emergency services. Egidi advised the decision to cross-staff the pumper-ambulance was based on a risk analysis that indicated cross-staffing was a manageable risk.

In 1997, a committee of U.S. military physicians and Fire Chiefs conducted a significant review of EMS services within the DoD. The EMS Ad Hoc Committee Final Report (DoD, 1998b) addressed all areas of EMS including ambulance transport. The report findings indicated 80 percent of U.S. military installation EMS transports were provided by MTF based operations with the remainder split between fire departments and community/contractor operations. The Ad Hoc Committee report recommended an increase in fire department based EMS to at least non-transport first responder with the transportation responsibility determined at the installation level. Further, the report stated transport services could probably be absorbed by fire departments at many installations with minimal increases in staffing. The key was an appropriate risk assessment. "The managers of the Component Services' Fire & Emergency Services must develop reasonable criteria to guide these decisions, based on fair assessment of risks, availability of back-up through mutual aid agreements or ISSAs, and additional non-emergency workloads" (DoD, 1998b, Tab 4, p. 4).

J.L. Mothershead (personal communication, August 4, 1998), the Chairman of the Ad Hoc Committee, stated that fire departments would be the most effective organization to take over the EMS transport service due to the lack of support for EMS by the U.S. military medical departments. He also stated the fire department would most likely provide a superior service, both in response times and clinical care. However, if the fire departments required full staffing to operate the ambulance, then a contract with the local community may be a more cost-effective profile. Mothershead further emphasized the need to develop criteria to determine when the fire department could absorb the ambulance transport function without increases in personnel.

Barela, Bair and Young (1998) conducted an audit of the U.S. Air Force ambulance services to determine whether MTF ambulance services were justified. The audit reviewed the ambulance services at 18 different U.S. Air Force installations and concluded the Air Force can maximize emergency response by using multiple ambulance service configurations. At 11 installations, the audit report recommended the fire department assume at least some of the ambulance transport function. The audit report concluded the fire departments already were responding to 54 percent of the medical emergencies on U.S. Air Force installations and that adding the ambulance to the fire department would not affect readiness (with two exceptions). However, the installation Fire Chiefs requested additional staffing to assume the ambulance responsibilities at 10 of the 11 installations.

The previous studies and reports on fire department based ambulance services influenced this research by indicating that fire departments outside the U.S. military services are increasingly involved in ambulance transport services. The studies and reports indicated there are many different profiles for providing the ambulance transport service and a number of fire departments utilize dual role, cross-trained firefighter/EMTs responding on ambulances. There were concerns about reducing fire suppression staffing in order to staff the ambulances, although a few fire departments have instituted an ambulance cross-staffing or similar program. Within the military, the fire departments have a unique opportunity to increase their role in EMS to include ambulance services. However, the reports indicated the fire departments must minimize staffing increases if they desire to absorb the ambulance services. Risk assessments will be a key element in determining the staffing requirements necessary to operate the ambulances.

Factors Affecting Fire Department Ambulance Cross-Staffing in the USMC

Telephone interviews were conducted with four USMC Fire Chiefs in order to determine the factors that affected ambulance cross-staffing in the USMC. All of the Fire Chiefs interviewed have experience with ambulance cross-staffing and their departments were included in the ambulance cross-staffing survey.

R.B. Wyman (personal communication, January 11,1999) stated that decreasing response times and improvement in patient care were the biggest benefits associated with the ambulance cross-staffing at U.S. Marine Corps Logistics Base (MCLB) Barstow. Major concerns included the additional paperwork and the additional costs associated with ambulance transport service. He stated there still were some concerns within his fire department that cross-staffing violated the DoD engine company staffing standards, which require four personnel per engine company. Wyman stated call volume, training and long term transports were important factors to consider in the determination to cross-staff the ambulances.

W.H. King (personal communication, January 11, 1999) stated improvements in patient care and public relations for the MCLB Albany Fire Department were the positive benefits of their ambulance cross-staffing program. King was most concerned with separation of the engine company personnel while the ambulance was transporting a patient. However, he felt this could be addressed through their mutual aid program.

C.B. Duffy (personal communication, January 15,1999) stated the ambulance cross- staffing program has been a great success with few negative factors at U.S. Marine Corps Air Station (MCAS) Yuma. Beneficial factors included improved patient care, speed and efficiency of service, more productive work from the fire department personnel and increased morale of the personnel. Duffy

stated he has some concerns with the "two-in, two-out" structural fire fighting provisions when they have only one engine company remaining due to an ambulance call. He felt the type and number of calls handled by the fire department and the availability and reliability of mutual aid were important factors in assessing the feasibility of ambulance cross-staffing.

C.E. Mehtvin (personal communication, January 15,1999) was a strong proponent of the ambulance cross-staffing program at MCAGCC, Twentynine Palms, CA. He stated the benefits of the program included increased morale of the fire department personnel, improvement in quality of care, better continuity of care and better fire department relationships with the U.S. Navy Hospital. Methvin felt training availability and program management were important factors to consider in accessing an ambulance cross-staffing program. Methvin added that emergency medical service was now the "bread and butter" operation of his department.

The interviews with the four USMC Fire Chiefs influenced this research by indicating there are a number of very positive benefits to the fire department operating the ambulance. Also significant were the few negatives expressed regarding the cross-staffing approach. All of the Fire Chiefs stated they would like to have additional people, but felt the cross-staffing approach was not significantly affecting their operations. There were few concerns regarding the fire department's ability to meet their other missions and few concerns that cross-staffing was increasing the safety risk to their personnel. Clearly, from the Fire Chiefs perspective, ambulance cross-staffing has been a success at four USMC installations.

Position of Other U.S. Military Services and the U.S. Coast Guard

Interviews were conducted with the fire and emergency service program managers from the U.S. Army, U.S. Navy, U.S. Air Force and the U.S. Coast Guard to determine their current position on ambulance cross-staffing.

B.A. Park (personal communication, December 16, 1998) stated the U.S. Army does permit ambulance cross-staffing and that is how most U.S. Army fire departments provide emergency medical transport service. Park further stated that a risk assessment was the most important tool to determine if cross-staffing would affect the departments ability to meet its other missions or compromise the safety of the its personnel. The risk assessment would also dictate the need for additional staffing to operate the ambulances.

W.D. Killen (personal communication, December 16, 1998) stated the U.S. Navy would consider ambulance cross-staffing on a case by case basis. He stated limitations on cross-staffing would be established based on risk analysis, availability of mutual aid, response time, crew availability and training. Killen further stated cross-staffing the ambulances could have a slight to moderate impact on the department's other missions and a moderate affect on safety.

G.F. Hall (personal communication, December 16, 1998) stated the U.S. Air Force would not utilize cross-staffing to provide ambulance service and would require additional staffing to provide an emergency medical transport capability. He felt ambulance cross-staffing would have substantial affect on the U.S. Air Force fire department's ability to meet it's other missions and would critically affect the safety of their personnel. Hall stated the U.S. Air Force already cross-staffs engine companies from their aircraft rescue fire fighting companies and there was insufficient staffing to consider further cross-staffing. He is also concerned with the additional training necessary to operate the ambulances. W. F. Bennyhoff (personal communication, January 15, 1999) stated they would utilize a cross-staffing

approach for multiple ambulance responses at Sheppard Air Force Base. However, the fire department was requesting seven additional personnel to operate the initial ambulance.

J. N. Karcher (personal communication, December 16, 1998) stated the U.S. Coast Guard would permit ambulance cross-staffing although their policy would limit emergency transport if it precludes another response. Karcher believes cross-staffing the ambulances does slightly compromise the U.S. Coast Guard fire department's ability to meet its other missions, but not unacceptably. He also stated cross-staffing does not affect personal safety if proper standard operating procedures were in place.

The information provided by the fire and emergency service program managers influenced this research by indicating most of the other U.S. military services and the Coast Guard were willing to consider a cross-staffing approach. However, the managers also indicated there were limitations to such an approach and that a proper risk assessment was critical before adding ambulance services without additional personnel. As Park stated in his comments, "There is no one size fits all policy for cross-staffing ambulances with fire and emergency services personnel."

PROCEDURES

Procedures used in this research attempted to address the three major areas in the Evaluation/Institutionalism Phase of the Change Management Model (U.S. Fire Administration, 1996). The procedures sought to evaluate the implementation of the ambulance cross-staffing policy, identify any necessary modifications to the cross-staffing policy and reinforce the new cross-staffing policy in order to institutionalize the program.

Procedures began with a literature review at the Learning Resource Center at the National Emergency Training Center in August 1998. Additional literature reviews were conducted at the

International Association of Fire Chiefs Management Information Center, the International Association of Fire Fighters EMS Publications Center and the Headquarters USMC Fire Protection Programs library and files. These literature reviews took place between September 1998 and January 1999.

The literature review focused on three major areas. The first was a search for authoritative sources that addressed fire department based ambulance services with specific emphasis on a cross-staffing profile. While few were identified, there were a number of different sources that addressed fire department based ambulance services utilizing dual role, cross trained personnel. The second search attempted to identify any factors that affected fire department based ambulance services and ambulance cross-staffing. The last search attempted to identify any affects on mission or safety as a result of cross-staffing ambulances or implementing a fire department based ambulance program.

Fire Chief Robert B. Wyman of the MCLB Barstow Fire Department and Fire Chief William H. King of the MCLB Albany Fire Department were interviewed by telephone on January 11, 1999. Fire Chief Charles B. Duffy of the MCAS Yuma Fire Department and Fire Chief Charles E. Methvin of the MCAGCC Twentynine Palms Fire Department were interviewed by telephone on January 15, 1999. The Fire Chiefs were interviewed to determine the status of the ambulance cross-staffing program in the USMC from the Chief Fire Officers' perspective. The interviews also provided insight to the factors that affected the cross-staffing approach at four USMC installations. Finally, the interviews were used to determine if there was consistency between the Fire Chiefs who manage the ambulance cross-staffing program and the fire and emergency service personnel who provide the service.

Fire Chief William F. Bennyhoff of the Sheppard Air Force Base Fire Department was interviewed by telephone on January 15, 1999. Chief Bennyhoff was interviewed about the Air Force reluctance to consider a cross-staffing approach for the ambulances.

Deputy Fire Chief William J. Egidi of the Federal Fire Department, San Diego was interviewed by telephone on January 28, 1999. Chief Egidi provided information on their pumper-ambulance concept, which was cross-staffed from an existing engine company.

Personal interviews were conducted with the members of the DoD Fire and Emergency Service Quality Working Group at their December 1998 meeting. The Working Group consisted of the fire and emergency service program managers from the U.S. military services and the U.S. Coast Guard. The interviews with Bruce A. Park, U.S. Army, William D. Killen, U.S. Navy, George F. Hall, U.S. Air Force, and James N. Karcher, U.S. Coast Guard were used in determining the willingness of the program managers to incorporate an ambulance cross-staffing program. The interviews also sought to identify the program manager's assessment on the limitations, mission affect and personal safety of a cross-staffing approach.

Description of Survey

A survey instrument titled "Ambulance Cross-Staffing Questionnaire" (see Appendix A), was provided to all the fire and emergency service personnel at MCLB Albany, MCLB Barstow, MCAS Yuma and MCAGCC Twentynine Palms. The purpose of this questionnaire was to evaluate the ambulance cross-staffing program from the viewpoint of the personnel who actually provide the service. The questionnaire posed a number of specific questions including rank and experience in the fire department, regular assignment to the ambulance, affect on the mission as a result of ambulance cross-staffing and affect on personal safety as a result of ambulance cross- staffing. For fire and emergency

service personnel who indicated ambulance cross-staffing had compromised the mission, the questionnaire attempted to determine the magnitude of the compromise. For personnel who indicated ambulance cross-staffing had compromised their personal safety, the questionnaire attempted to determine the magnitude and frequency of the compromise. The DoD Safety and Occupational Health Program Instruction (DoD, 1998a) was used to assign a corresponding risk assessment code based on the magnitude and frequency of the safety compromise. Finally, the questionnaire asked if the USMC should revise the ambulance cross-staffing policy.

The questionnaire to the USMC fire and emergency service personnel was field tested on small groups and a few revisions were made prior to actual distribution. The questionnaire was provided to the Fire Chiefs at the four USMC fire departments who participated in the survey. The Fire Chiefs distributed copies of the questionnaire to their respective fire and emergency service personnel. Only operational personnel (fire fighters, driver/operators and lead fire fighters) were provided copies of the questionnaire. A total of 107 questionnaires were distributed and 92 were completed and returned for a response rate of 86.0 percent. Table 1 provides the frequency distribution and response rate for the individual fire departments. Table 2 provides demographic information on the fire and emergency personnel who responded to the questionnaire.

The data from the questionnaire was compiled and entered into a relational database (Microsoft Access 97). The results were tabulated and used to help answer the research questions.

TABLE 1

Frequency Distribution of Fire Department Questionnaires by Number Distributed and Number Completed and Returned.

Questionnaires	Distributed	Completed and Returned	% Completed and Returned
Fire Department			
MCLB Albany	18	17	94.4
MCLB Barstow	37	36	97.3
MCAS Yuma	22	21	95.5
MCAGCC Twentynine Palms	30	18	60.0
Total	107	92	86.0

TABLE 2

Frequency Distribution of Questionnaire Respondents by Rank, Experience and Regular Assignment to the Ambulance

Fire Department	MCLB Albany	MCLB Barstow	MCAS Yuma	MCAGCC Twentynine Palms	Total	%
Rank						
Fire Fighter	8	14	13	9	44	47.8
Driver/Operator	5	15	4	5	29	31.5
Lead Fire Fighter	4	7	4	4	19	20.7
Total	17	36	21	18	92	100
Years of Experience						
< 1	0	3	3	2	8	8.7
1-5	1	5	3	4	13	14.1
5-10	3	11	2	3	19	20.7
10-20	12	14	11	8	45	48.9
>20	1	3	2	1	7	7.6
Total	17	36	21	18	92	100
Assigned to Ambulance						
Yes	11	22	11	11	55	59.8
No	6	14	7	10	37	40.2
Total	17	36	18	21	92	100

Setting

The MCLB Albany Fire Department is a career fire department of 37 personnel protecting a large maintenance and logistics center in southwest Georgia. The department operates two engine companies and cross-staffs one rescue and one basic life support ambulance from a single fire station. The MCLB Barstow Fire Department is a career department of 52 personnel. The department operates four engine companies and cross-staffs one rescue and two basic life support ambulances from two fire stations. The department provides services to a large maintenance and logistics center in southwest California. The MCAS Yuma Fire Department provides protection for the premier USMC aviation training facility located in southwest Arizona. The department consists of 33 career personnel operating from one fire station. The department operates two engine companies and cross-staffs one rescue and one basic life support ambulance. At the time of the survey, the department was in the process of upgrading an engine company to advanced life support capability. The MCAGCC Fire Department is a career department of 43 personnel protecting the USMC's combined air-ground training installation. The department operates three engine companies and cross-staffs one rescue and two basic life support ambulances from two fire stations. The department also operates the emergency communication center for the installation.

Limitations and Assumptions

The research was affected by a number of limitations and assumptions. The first assumption was that all questionnaires would be answered truthfully by respondents who understood the questions and the ambulance cross-staffing policy. While this assumption could not be confirmed, the comments by some of the respondents (see Appendix B) indicated a lack of understanding about the ambulance cross-staffing policy. For example, a number of respondents indicated there was nothing wrong with the ambulance cross-staffing policy except for the need to provide additional staffing for the

ambulances. This calls into question the understanding of the cross-staffing policy since a key element of the policy development was the knowledge additional staffing was not available.

Although there were six USMC fire departments utilizing the ambulance cross-staffing program, two departments were not included in the survey because they were scheduled to close in July 1999 as part of the military base closure process. At the time of the survey, many permanent personnel had left the fire departments and were replaced with temporary personnel.

The "Ambulance Cross-Staffing Questionnaire" survey instrument was incomplete in two areas. First, the questionnaire focused almost entirely on the negative aspects of the ambulance cross-staffing policy. There were no questions that addressed the positive aspects of the policy. Therefore, it was not possible to evaluate or draw conclusions on the positive factors associated with the ambulance cross-staffing policy. The survey instrument also failed to expand the respondents yes or no answer to the policy revision question (Question 7). As a result, the research could not draw specific conclusions on the reasons behind the respondent's answer to the question.

The survey instrument assumed that mission compromises and personal safety compromises were the factors that would play a negative role in the ambulance cross-staffing policy. There may well be other factors that affected the policy that were not captured by the survey.

The research was limited in that it only addressed subjective factors from the fire and emergency service personnel regarding ambulance cross-staffing policy. A full evaluation would require analysis of the objective factors such as call volume, mutual aid agreements and non-emergency workloads (DoD, 1998b).

Finally, the literature review was limited in identifying fire departments that utilized an ambulance cross-staffing approach. Most of the articles, reports and surveys on fire department based ambulance

services reviewed for the research did not specify the ambulance transport profile or identified separate staffing for the ambulances. This is an indication that most career fire departments do not currently utilize a cross-staffing approach.

Definitions

For the purposes of this research, the following definitions apply:

Ambulance Cross-Staffing: Using existing fire and emergency service personnel from a fully staffed engine company to staff an ambulance.

Engine Company: A compliment of fire and emergency service personnel staffing a fire department pumper (Commandant of the Marine Corps, 1997). In the USMC, a fully staffed engine company consists of four personnel assigned to the pumper.

Regular Assignment to an Ambulance: Consistently assigned to an ambulance five or more times per month.

Risk Assessment: A structured process to identify and assess risks of a fire department program or operation. The risk level is expressed in terms or threat magnitude and frequency.

Risk Assessment Code: An expression of risk associated with a threat that combines magnitude and frequency into a single Arabic number (DoD, 1998a).

Slight Mission Compromise: Causes minor reduction in fire department effectiveness with little affect on missions.

Moderate Mission Compromise: Causes significant reduction in fire department effectiveness, but still able to meet missions.

Substantial Mission Compromise: Causes major reduction in fire department effectiveness that prevents the department from meeting its missions.

Minor Safety Compromise: Causes minimal threat to safety but is a violation of standard operating procedures.

Moderate Safety Compromise: Threat magnitude that could result in lost workday injury.

Serious Safety Compromise: Threat magnitude that could result in temporary disability.

Critical Safety Compromise: Threat magnitude that could result in death or permanent disability.

Infrequent Safety Compromise: Threat frequency of two incidents or less per year.

Occasional Safety Compromise: Threat frequency of three to six incidents per year.

Frequent Safety Compromise: Threat frequency of seven to twelve incidents per year.

Very Frequent Safety Compromise: Threat frequency of more than twelve incidents per year.

RESULTS

1. Does the literature support cross-staffing ambulances using existing fire department personnel?

The literature review indicated that ambulance cross-staffing is not a common practice within either municipal or U.S. military career fire departments. None of the fire service EMS surveys conducted for the International Association of Fire Chiefs (1991, 1995) identified ambulance cross-staffing as a transport profile. In most cases, separate personnel staff the ambulances and the fire engines, although the personnel are often cross-trained. However, there were notable exceptions and there was increasing interest in ambulance cross-staffing or similar transport profiles. The Lee Summit Fire Department, City of San Diego Fire & Life Safety Services Department and the Federal Fire Department, San Diego all have utilized a cross-staffing profile for a portion of their transport services. All but one of the U.S. military fire and emergency service program managers indicated they would at

least consider ambulance cross- staffing in some cases. Finally, all the USMC Fire Chiefs who have instituted ambulance cross-staffing have indicated support for the program.

Based on the literature review, there is support for an ambulance cross-staffing program, however it is clearly not the norm. The literature review also indicated there are a number of important variables that must be considered before instituting an ambulance cross-staffing program. As indicated by W.D. Killen (personal communication, December 16, 1998), B.A. Park (personal communication, December 16, 1998), W.J. Egidi (personal communication January 28, 1999) and the EMS Ad Hoc Committee (DoD, 1998b), a risk assessment is the best tool to evaluate the variables and determine the feasibility of an ambulance cross-staffing program.

2. Has ambulance cross-staffing affected the fire department's ability to deliver other emergency services? If so, what is the magnitude?

Table 3 provides the data from the fire and emergency service personnel concerning the compromise of fire and emergency service missions due to ambulance cross-staffing. Fifty-two of the 92 respondents indicated cross-staffing did not compromise the ability of the fire department to meet its other emergency service missions. Of the 40 respondents who indicated cross-staffing did compromise the department's other missions, 12 (13 percent) stated there was only a slight reduction in effectiveness while 18 (19.6 percent) indicated there was a moderate reduction in effectiveness, however they were still able to meet the missions. Ten (10.9 percent) respondents indicated there was substantial compromise that would prevent the fire department from meeting its emergency service missions.

Fire suppression (35.9 percent), hazardous materials response (29.3 percent) and rescue (23.9 percent) were the major mission areas subject to compromise as a result of ambulance cross-staffing.

Only 12 (13.0 percent) respondents indicated the training mission was compromised and just 8 (8.7 percent) respondents indicated the fire prevention mission was compromised.

The fire and emergency personnel at MCLB Albany had a very high percentage of personnel who indicated cross-staffing the ambulance compromised their department's ability to meet other missions. Sixteen of 17 respondents from the MCLB Albany Fire Department affirmed the compromise and 8 of the respondents felt the compromise substantially affected their ability to deliver other fire and emergency service missions. Conversely, only 3 respondents from the MCAGCC Twentynine Palms Fire Department felt their missions were compromised and 2 of the 3 felt the magnitude was slight with little affect on the other fire and emergency service missions.

Table 4 shows the demographics of the respondents who indicated ambulance cross-staffing compromised the fire department's emergency service missions. In terms of rank, the adverse affect on mission was very consistent between the fire fighter (40.9 percent), driver/operator (48.3 percent) and the lead fire fighter (42.1 percent). In terms of experience, fire and emergency personnel with less than one year of experience had the lowest adverse affect on the mission at 25 percent and personnel with one to 5 years of experience had a 38.5 percent adverse affect. All personnel with more than 10 years experience had an adverse affect of 42.9 percent or greater. Twenty-three of the 55 respondents who were regularly assigned to the ambulance indicated cross-staffing compromised the emergency service missions. This was consistent with the 17 of 37 respondents who were not regularly assigned to the ambulance.

TABLE 3

Frequency Distribution of Questionnaire Respondents Concerning Compromise of Fire and Emergency Service Missions

Fire Department	MCLB Albany	MCLB Barstow	MCAS Yuma	MCAGCC Twentynine Palms	Total	%
Compromised Mission						
Yes	16	15	6	3	40	43.5
No	1	21	15	15	52	56.5
Total	17	36	21	18	92	100
Magnitude of Compromise						
Slight	5	4	1	2	12	13.0
Moderate	3	10	4	1	18	19.6
Substantial	8	1	1	0	10	10.9
Total	16	15	6	3	40	43.5
Missions Compromised						
Fire Suppression	14	11	5	3	33	35.9
Hazardous Materials	14	10	2	1	27	29.3
Fire Prevention	4	3	1	0	8	8.7
Rescue	13	7	2	0	22	23.9
Training	5	6	1	0	12	13.0
Other	0	5	1	0	6	6.5
Total	50	42	12	4	108	

TABLE 4

Relationship between Magnitude of Compromised Missions and Respondent Demographics of Rank, Experience and Regular Assignment to the Ambulance

Magnitude	Slight	Moderate	Substantial	Total	Number of Respondents	%
Rank						
Fire Fighter	6	8	4	18	44	40.9
Driver/Operator	4	7	3	14	29	48.3
Lead Fire Fighter	2	3	3	8	19	42.1
Total	12	18	10	40	92	
Years of Experience						
<1	2	0	0	2	8	25.0
1-5	1	4	0	5	13	38.5
5-10	3	4	2	9	19	47.4
10-20	6	8	7	21	45	46.7
>20	0	2	1	3	7	42.9
Total	12	18	10	40	92	
Assigned to Ambulance						
Yes	6	11	6	23	55	41.8
No	6	7	4	17	37	45.9
Total	12	18	10	40	92	

3. Has ambulance cross-staffing compromised fire department personal safety during emergency operations? If so, what is the risk?

Table 5 provides the data from the fire and emergency service personnel concerning personal safety as a result of ambulance cross-staffing. Fifty-five of the 92 respondents indicated cross-staffing did not compromise fire department personal safety. Insufficient personnel (34.8 percent) and crew separation (33.7 percent) were cited as the major safety concerns by the 37 respondents who indicated cross-staffing the ambulance did compromise personal safety. Eleven (12.0 percent) respondents cited increased call volume as a safety concern.

In terms of the magnitude of the safety compromise, Table 6 indicates an almost uniform split between minor (9.8 percent), moderate (7.6 percent), serious (9.8 percent) and critical (9.8 percent) compromises. Table 6 also shows the data on the frequency of the safety compromise. Eleven (12.0 percent) respondents indicated their personal safety was frequently compromised, 10 (10.9 percent) indicated an occasional compromise and 8 (8.7 percent) indicated an infrequent compromise. Only 5 (5.4 percent) respondents indicated their personal safety was very frequently compromised.

The fire and emergency personnel at MCLB Albany had a high percentage of personnel who felt their personal safety was compromised. Twelve of 17 respondents from the MCLB Albany Fire Department felt their safety was compromised and 5 of the respondents felt the compromises were critical. Conversely, only one respondent from the MCAGCC Twentynine Palms Fire Department felt their safety was compromised due to the ambulance cross-staffing.

In terms of risk, there were 8 respondents who felt the safety compromises posed an imminent danger and 6 respondents who felt the compromises posed a serious risk. Four respondents indicated the risk was moderate, 4 indicated the risk was minor and 11 indicated the risk was negligible. The

relative risk was determined by comparing the frequency and magnitude of the safety compromises and assigning a risk assessment code (DoD, 1998a). The relationship between the frequency and magnitude of the safety compromises and the corresponding risk assessment code is shown on Table 7.

Tables 8 and 9 show the relationship between the magnitude and frequency of the safety compromises and demographics of the fire and emergency service personnel who indicated ambulance cross-staffing compromised their personal safety. In terms of rank, lead fire fighters were most concerned with safety compromises with 52.6 percent of the respondents expressing concern in terms of both magnitude and frequency. This was followed by 41.4 percent for the driver /operators and 27.3 percent for the fire fighters. In terms of experience, personnel with less than 5 years experience had a 25 percent or less response rate for personal safety compromises while personnel with more than 10 years had a 40 percent or higher response rate. Fire and emergency service personnel with more than 20 years of experience had the highest personal safety concern rate at 57.1 percent. Nineteen of the 55 respondents who were regularly assigned to the ambulance indicated cross-staffing compromised their personal safety compared to 15 of 37 respondents who were not regularly assigned to the ambulances.

TABLE 5

Frequency Distribution of Questionnaire Respondents Concerning Compromise of Personal Safety During Emergency Operations

Fire Department	MCLB Albany	MCLB Barstow	MCAS Yuma	MCAGCC Twentynine Palms	Total	%
Compromised Safety						
Yes	12	17	7	1	37	40.2
No	5	19	14	17	55	59.8
Total	17	36	21	18	92	100
Reasons Safety Compromised						
Insufficient Personnel	12	15	4	1	32	34.8
Crew Separation	12	14	4	1	31	33.7
Insufficient Experience	2	2	2	0	6	6.5
Insufficient Training	3	4	2	0	9	9.8
Increased Call Volume	8	1	2	0	11	12.0
Other	0	2	0	0	2	2.2
Did Not Indicate	0	1	0	0	1	1.0
Total	37	39	14	2	92	

TABLE 6

Frequency Distribution of Questionnaire Respondents Concerning Magnitude and Frequency that Personal Safety Was Compromised

Fire Department	MCLB Albany	MCLB Barstow	MCAS Yuma	MCAGCC Twentynine Palms	Total	%
Magnitude of Compromise						
Minor	2	5	2	0	9	9.8
Moderate	2	3	2	0	7	7.6
Serious	3	5	1	0	9	9.8
Critical	5	3	0	1	9	9.8
Did Not Indicate	0	1	2	0	3	3.2
Total	12	17	7	1	37	40.2
Frequency of Compromise						
Infrequently	3	2	2	1	8	8.7
Occasionally	0	9	1	0	10	10.9
Frequently	4	5	2	0	11	12.0
Very Frequently	4	0	1	0	5	5.4
Did Not Indicate	1	1	1	0	3	3.2
Total	12	17	7	1	37	40.2

TABLE 7

Relationship between Magnitude and Frequency of Personal Safety Compromise (Risk Assessment Code)

Frequency	Infrequent	RAC	Occasional	RAC	Frequent	RAC	Very Frequent	RAC
Magnitude								
Minor	5	(5)	4	(5)	0	(4)	0	(4)
Moderate	2	(5)	3	(4)	1	(3)	1	(2)
Serious	0	(4)	3	(3)	5	(2)	1	(1)
Critical	1	(4)	0	(2)	5	(1)	2	(1)

Risk Assessment Code	Descriptor	Action Required
RAC (1)	Imminent Danger	Immediate Action to Eliminate Hazard
RAC (2)	Serious	Immediate Action to Reduce Hazard
RAC (3)	Moderate	Prompt Action to Reduce Hazard
RAC (4)	Minor	Defer Until Scheduled Replacement
RAC (5)	Negligible	No Action Required

TABLE 8

Relationship between Magnitude of Compromised Safety and Respondent Demographics of Rank, Experience and Regular Assignment to the Ambulance

Magnitude	Minor	Moderate	Serious	Critical	Total	Number of Respondents	%
Rank							
Fire Fighter	4	1	4	3	12	44	27.3
Driver/Operator	2	5	3	2	12	29	41.4
Lead Fire Fighter	3	1	2	4	10	19	52.6
Total	9	7	9	9	34	92	
Years of Experience							
<1	1	0	1	0	2	8	25.0
1-5	2	0	0	0	2	13	15.4
5-10	2	2	3	1	8	19	42.1
10-20	3	5	3	7	18	45	40.0
>20	1	0	2	1	4	7	57.1
Total	9	7	9	9	34	92	
Assigned to Ambulance							
Yes	5	3	6	5	19	55	34.5
No	4	4	3	4	15	37	40.5
Total	9	7	9	9	34	92	

TABLE 9

Relationship between Frequency of Compromised Safety and Respondent Demographics of Rank, Experience and Regular Assignment to the Ambulance

Frequency	Infrequent	Occasional	Frequent	Very Frequent	Total	Number of Respondents	%
Rank							
Fire Fighter	3	3	3	3	12	44	27.3
Driver/Operator	3	4	4	1	12	29	41.4
Lead Fire Fighter	2	3	4	1	10	19	52.6
Total	8	10	11	5	34	92	
Years of Experience							
<1	1	1	0	0	2	8	25.0
1-5	1	1	0	0	2	13	15.4
5-10	1	4	2	0	7	19	36.8
10-20	5	3	6	5	19	45	42.2
>20	0	1	3	0	4	7	57.1
Total	8	10	11	5	34	92	
Assigned to Ambulance							
Yes	3	6	6	4	19	55	34.5
No	5	4	5	1	15	37	40.5
Total	8	10	11	5	34	92	

4. Should the USMC revise the fire department ambulance cross-staffing policy?

Table 10 indicates 54 (58.7 percent) of the fire and emergency service personnel felt the ambulance cross-staffing policy should be revised compared with 38 (41.3 percent) who did not recommend a change. The number of respondents recommending a change to the policy was significantly higher than the number of respondents who felt the emergency service missions were compromised (43.5 percent) or who felt their personal safety was compromised (40.2 percent). All personnel from MCLB Albany Fire Department recommended a revision to the cross-staffing policy. This was consistent with the MCLB Albany Fire Department responses on the mission and safety compromises. The other three fire departments were almost evenly split on the policy change question.

Table 11 provides the relationship between the ambulance cross-staffing policy change and the respondent demographics of the fire and emergency service personnel. The data shows the higher ranking and more experienced personnel were more likely to recommend a policy revision. In terms of rank, 50 percent of the fire fighters recommended a policy change while 65.5 percent of the driver/operators and 68.4 percent of the lead fire fighters recommended a change. In the experience demographic, less than half the personnel with 5 years experience or less recommended a change in policy. However, over 60 percent of the personnel with more than 5 years experience recommended a change. Of the personnel regularly assigned to the ambulance, 33 (60 percent) indicated the policy should be revised which was fairly consistent with the 21 respondents (56.8 percent) who were not regularly assigned to the ambulance, but also recommended a change in policy.

TABLE 10

Frequency Distribution of Questionnaire Respondents Concerning Revision to Ambulance Cross-Staffing Policy

Fire Department	MCLB Albany	MCLB Barstow	MCAS Yuma	MCAGCC Twentynine Palms	Total	%
Revise Cross-Staffing Policy						
Yes	17	19	10	8	54	58.7
No	0	17	11	10	38	41.3
Total	17	36	21	18	92	100

TABLE 11

Relationship between Revision to Ambulance Cross-Staffing Policy and Respondent Demographics of Rank, Experience and Regular Assignment to the Ambulance

Revise Cross-Staffing Policy	Yes	%	No	%	Total
Rank					
Fire Fighter	22	50.0	22	50.0	44
Driver/Operator	19	65.5	10	34.5	29
Lead Fire Fighter	13	68.4	6	31.6	19
Total	54		38		92
Years of Experience					
<1	3	37.5	5	62.5	8
1-5	6	46.2	7	53.8	13
5-10	13	68.4	6	31.6	19
10-20	27	60.0	18	40.0	45
>20	5	71.4	2	28.6	7
Total	54		38		92
Assigned to Ambulance					
Yes	33	60.0	22	40.0	55
No	21	56.8	16	43.2	37
Total	54		38		92

DISCUSSION

The Commandant of the Marine Corps first proposed the ambulance cross-staffing policy in 1992 with the goal of improving the EMS delivery on USMC installations and increasing the effectiveness of the USMC fire departments. However, the Commandant recognized cross-staffing would only be effective at installations that could absorb the ambulance without compromising the other fire and emergency service missions of the fire department or increasing the safety risk to the fire department personnel. The results of this research indicated ambulance cross-staffing can meet the Commandant's original goal. The Fire Chiefs from the four USMC Fire Departments who participated in the study all acknowledged that ambulance cross-staffing had improved the EMS delivery and increased the fire department effectiveness.

The questionnaire results suggest that cross-staffing the ambulances was a well-established practice at MCAGCC Twentynine Palms. This was borne out by the positive responses of the fire department personnel and the Fire Chief's statement that EMS was the bread and butter operation of his department (C.E. Methvin, personal communication, January 15,1999). However, the research also indicated ambulance cross-staffing was not yet an accepted practice by all the USMC Fire Departments who have implemented the program. This was especially true at MCLB Albany where all the fire department personnel recommended a revision to the cross-staffing policy. A significant number of fire and emergency service personnel remain concerned the fire suppression, hazardous materials response and rescue missions were compromised by the cross-staffing policy. Many personnel also were concerned the cross-staffing policy created crew separation and insufficient personnel safety issues. As a result, the research indicated ambulance cross-staffing was not institutionalized. Additional effort and monitoring will be necessary to fully implement the ambulance cross-staffing policy within the USMC.

The results of the questionnaire did indicated positive trends towards acceptance of the ambulance cross-staffing policy. Over 89 percent of the respondents indicated they could meet their fire and emergency service missions while cross-staffing the ambulances. In terms of safety, almost 60 percent felt there was no compromise to personal safety as a result of ambulance cross-staffing and only 9 percent felt the safety risk posed an imminent danger. The positive trends are further exemplified when examining the results from MCLB Barstow, MCAS Yuma and MCAGCC Twentynine Palms. By deleting MCLB Albany, over 97 percent of the respondents indicated they could meet their other emergency service missions and less than 5 percent of the respondents indicated there were imminent danger safety risks. These positive trends are consistent with the observations of USMC Fire Chiefs R.B. Wyman (personal communication, January 11, 1999), C.B. Duffy (personal communication, January 11, 1999) and C.E. Methvin (personal communication, January 15, 1999). All the Fire Chiefs indicated ambulance cross-staffing had not significantly affected their ability to meet their other missions or increased the safety risk to their personnel.

The research clearly indicates there are major concerns with ambulance cross-staffing at MCLB Albany. The fire and emergency personnel had a high percentage of concerns for mission and safety compromises as well as universal agreement the cross-staffing policy should be revised. The research was not able to specifically identify the reasons for such negative trends, although the comments from the respondents (see Appendix B) indicated a strong desire for additional personnel in order to operate the ambulance. This conclusion is supported by 71 percent of the MCLB Albany respondents who felt insufficient personnel and crew separation were the major reasons their personal safety was compromised. This conclusion is also supported by the observations of Fire Chief W.H. King (personal communication, January 11, 1999) who indicated he was concerned about the separation of engine

company personnel during ambulance transport. Finally, the experience demographic of the MCLB Albany personnel may also play a role in the negative trend. MCLB Albany had the highest number of personnel (70.6 percent) with more than 10 years of experience and the data indicated personnel with more than 10 years experience were more likely to express concerns about the affect on mission or safety.

The questionnaire results indicated the traditional fire department services of fire suppression and rescue along with hazardous materials response were the major areas of concern for mission compromise. These findings are consistent with the U.S. Air Force (G.H. Hall, personal communication, December 16,1998) and the City of San Francisco (International Association of Fire Chiefs, 1996), who were concerned about the affects of cross-staffing on the other emergency service missions, especially fire suppression. The findings further emphasize the need for a comprehensive risk and workload assessment before instituting a cross-staffing program. The assessment should evaluate the affect on all fire and emergency service missions and the safety and workload affects on the fire and emergency service personnel. The assessment should also provide an indication of the risks to the installation and the fire and emergency service personnel. The need for a risk assessment is consistent with the conclusions by B.A. Park (personal communication, December 16, 1998), W.D. Killen (personal communication, December 16, 1998), W.J. Egidi (personal communication, December 28, 1999) and the EMS Ad Hoc Committee (DoD, 1998b).

The respondents identified insufficient personnel and crew separation as the greatest reasons their personal safety was compromised. This was not surprising given that ambulance cross-staffing by definition will decrease the engine company staffing while the ambulance is in transport. Additionally, the recent debate in the fire service over staffing standards may well have influenced these trends,

although that could not be verified by this research. The data indicated that MCLB Albany and MCLB Barstow personnel were most concerned with insufficient personnel and crew separation. This was consistent with the statements by MCLB Albany Fire Chief W.H. King (personal communication, January 11, 1999), who was most concerned with crew separation and MCLB Barstow Fire Chief R.B. Wyman (personal communication, January 11, 1999), who expressed concerns that ambulance cross-staffing may violate the DoD staffing standards.

A significant relationship was found between the experience of the respondents and their concern for personal safety, mission compromise and revisions to the cross-staffing policy. The greater the experience of the personnel, particularly for personnel with more than 5 years of experience, the greater their concern for fire and emergency service mission compromises, personal safety compromises and the desire to revise the cross-staffing policy. A similar relationship was found for the rank of the respondents except in the area of mission compromises, which was fairly consistent between the fire fighter, driver/operator and lead fire fighter. In terms of the magnitude and frequency of safety compromises and the cross-staffing policy, the higher the rank, the greater concern for the compromise and the desire to revise the policy. While there may be many reasons for these relationships, it is an indication that a significant change is more difficult for personnel who have been in an existing system for an extended period of time. This can certainly be understood given the relative short length of time the ambulance cross-staffing policy has been in place.

There did not seem to be any relationship between mission and safety compromises and regular assignment to the ambulance. This was somewhat surprising, as one would expect that personnel always assigned to the ambulance would not be as concerned with the compromises to the other fire and emergency missions. However, the data indicated personnel assigned to the ambulances had

approximately the same level of concern as the personnel always assigned to the engine companies. This may be a reflection that the majority of the personnel who staff the ambulances were previously regularly assigned to the engine companies.

More than 58 percent of the respondents indicated they felt the ambulance cross-staffing policy should be revised even though less than 44 percent felt the ambulance cross-staffing affected their ability to meet their emergency service missions or compromised their personal safety. Even MCAGCC Twentynine Palms, which had almost no mission or safety concerns expressed by the respondents, had a 44 percent response recommending a policy revision. Unfortunately, the questionnaire did not ask the respondents how they wanted the policy revised, so this research cannot provide a definitive explanation. However, the comments from the respondents (see Appendix B) indicate many believe the policy should require additional staffing to operate the ambulance, even if cross-staffing does not compromise the other missions or personal safety. This is consistent with audit by Barela, et al. (1998) who found a majority of U.S. Air Force Fire Chiefs requesting additional staffing to operate the ambulances, even though the ambulance function would not affect fire department readiness. This finding may also be a recognition that cross-staffing the ambulances is not the normal staffing profile for emergency medical services today. As the literature review indicated, most career fire departments provide additional staffing to operate the ambulances.

RECOMMENDATIONS

The most important recommendation stemming from this research was the verification that ambulance cross-staffing can be a successful emergency medical system transport program for the USMC. Clearly, ambulance cross-staffing is not appropriate for every installation, but for specific installations, it can provide an improved service delivery without serious compromises to emergency

service missions or personal safety. The results from the MCAGCC Twentynine Palms respondents indicated ambulance cross-staffing can be institutionalized in a fire and emergency services program.

It is imperative that a risk assessment is performed on any fire department considering an ambulance cross-staffing approach. The assessment must evaluate the affect on the department's mission, personal safety risks and the workload increases on the fire department personnel. It is also recommended that personnel from all ranks of the department participate in the risk assessment due to the sensitive nature of staffing issues. Cross-staffing should only be considered a viable alternative when the risk assessment verifies the fire department can incorporate the ambulance mission without significant compromises to the other department missions or to the safety of its personnel.

Another significant recommendation from the research was the need for the USMC to continue monitoring the implementation of the ambulance cross-staffing policy, especially at MCLB Barstow and MCAS Yuma. The research suggests the fire departments at these two installations are moving towards acceptance of the ambulance cross-staffing program. However, additional effort is required to address the concerns raised by the fire and emergency service personnel to ensure the program is institutionalized.

A reevaluation and further risk assessment of ambulance cross-staffing at the MCLB Albany Fire Department is needed. The high percentage of concerns regarding mission compromise, personal safety compromise and the desire for policy revisions requires prompt attention. It will be important to evaluate the subjective concerns of the fire and emergency service personnel with the objective factors identified in the evaluation and risk assessment.

It will be important for the USMC and the DoD to develop criteria for ambulance cross-staffing. Without criteria, there are no standards that an installation can use to determine the feasibility of

a cross-staffing approach. This recommendation is consistent with the EMS Ad Hoc Committee Final Report (DoD, 1998b) and J.L. Mothershead (personal communication, August 4, 1998). Both recommended the development of reasonable criteria for ambulance transportation services based on risk assessment, availability of mutual aid and the additional non-emergency workloads.

Finally, additional research is recommended to determine the reasons a significant percentage of the respondents felt the cross-staffing policy needed revisions. If the major reason is just the desire for additional staffing, then further discussion and education on the merits of an ambulance cross-staffing program is required. However, if there are recommendations that could strengthen the policy, they should be incorporated.

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APPENDIX A

Ambulance Cross-Staffing Questionnaire and Cover Memorandum

HEADQUARTERS UNITED STATES MARINE CORPS
FACILITIES AND SERVICES DIVISION
FIRE PROTECTION PROGRAMS (LFF-1)
2 Navy Annex
Washington, DC 20380-1775
(703)695-9453
DSN 225-9453

MEMORANDUM

TO: Marine Corps Fire Service Emergency Response Personnel
FROM: Kevin King, Manager, Fire Protection Programs
SUBJECT: AMBULANCE CROSS-STAFFING QUESTIONNAIRE
DATE: 1 October 1998

Please find attached the subject questionnaire that will be used to provide an internal evaluation on cross-staffing ambulances within the Marine Corps. The evaluation is also being performed to satisfy one of my applied research requirements for the Executive Fire Officer Program at the National Fire Academy. The questionnaire will only be distributed to emergency response personnel (fire fighter through crew chief) and is intended for your individual assessment of this program. Please answer the questions based on your own beliefs and experiences, not based on the opinions of other personnel. You are not required to provide your name on the questionnaire, although your individual comments are encouraged at the end of the questionnaire.

Please complete the questionnaire as promptly as possible and return to your Fire Chief no later then 30 October 1998. The Fire Chief will forward the responses to me for use in the evaluation. When completed, I will provide a copy of the research report to each department that participated in the survey.

I thank you for your attention and support for this project. If you have any questions, please do not hesitate to contact me at the above phone numbers.

MARINE CORPS FIRE SERVICE

Ambulance Cross-Staffing Questionnaire

The following questionnaire pertains to cross-staffing the Navy ambulances in your department. The answers from the questionnaire will be used to evaluate the ambulance cross-staffing policy within the Marine Corps. Please answer the following based on your own beliefs and experiences. Please do not answer based on the opinions or experiences of others. Thank you for your attention.

1. Name of your department: _____

2. Current rank in department:

_____ Firefighter
_____ Driver/Operator
_____ Lead Firefighter (Crew Chief)

3. Experience (total service in department)

_____ Less than 1 year
_____ 1 to 5 years
_____ 5 to 10 years
_____ 10 to 20 years
_____ More than 20 years

4. Are you regularly assigned (5 or more times a month) to the ambulance?

_____ Yes _____ No

5. Do you believe cross-staffing the ambulances has compromised your department's ability to meet its other fire protection and emergency service missions?

_____ Yes _____ No

If you answered yes to question 5, what missions have been compromised? Please check all that apply. (If you answered no to question 5, go to question 6)

_____ Fire Suppression
_____ Hazardous Materials Response
_____ Fire Prevention/Public Education
_____ Rescue
_____ Training
_____ Other (please list) _____

If you answered yes to question 5, how serious have the other fire protection and emergency service missions been compromised? (If you answered no to question 5, go to question 6)

_____ Slight (minor reduction in effectiveness with little affect on missions)
_____ Moderate (significant reduction in effectiveness, but still able to meet missions)
_____ Substantial (major reduction in effectiveness that prevents the department from meeting missions.)

6. Do you believe cross-staffing the ambulances compromised your safety during emergency operations?

_____ Yes _____ No

If you answered yes to question 6, why has your safety been compromised? Please check all that apply. (If you answered no to question 6, go to question 7)

_____ Insufficient Personnel
_____ Crew Separation
_____ Insufficient Experience
_____ Insufficient Training
_____ Increased Call Volume
_____ Other (please list) _____

If you answered yes to question 6, how often has your safety been compromised? (If you answered no to question 6, go to question 7)

_____ Infrequently (two times or less per year)
_____ Occasionally (three to six times per year)
_____ Frequently (seven to 12 times per year)
_____ Very frequently (more than 12 times per year)

If you answered yes to question 6, how serious has your safety been compromised? (If you answered no to question 6, go to question 7)

_____ Critical (could result in death or permanent disability)
_____ Serious (could result in temporary disability)
_____ Moderate (could result in lost workday injury)
_____ Minor (minimal threat to safety but a violation of standard operating procedures)

7. Do you believe the Marine Corps should revise its policy on cross-staffing the ambulances?

_____ Yes _____ No

Comments: _____
_____
_____
_____
_____

APPENDIX B

Respondent Comments from the Ambulance Cross-Staffing Questionnaire

The following comments from the respondents were included on the comment section of the Ambulance Cross-Staffing Questionnaire. They have been edited for spelling, but have not been edited for content.

MCLB Albany

If the Marine Corps wants the fire dept. to man the ambulances, they should increase the manning levels, they should increase the level of training for individuals who want more knowledge. Training should be readily available and met with open arms by supervisors. The ambulance crew could and will make life-threatening decisions. Wrong decisions could cost lives or lawsuits. Additional responsibility should be additional pay.

Patient care is critical! Additional personnel to man the ambulance and maintain a higher level of training for patient care. I also might add cross-staffing compromises patient care. What's needed is GS-6 medical crews (permanently) in addition to fire suppression.

If we're going to man ambulance service for the department, then give Chief King the personnel to man our department to do the job. There also should be upgrades with this position. My job is compromised everytime I make a run because of undermanning. I consider myself a fair person and I take my job serious. Whoever it is needs to stop shafting us around and use some common sense to make this department a better place. Most of the personnel here are ok, they have just been shafted so much, they don't know what to believe.

Manpower needs to be increased from 9-persons to 12-persons per shift in this department.

I feel that the ambulance should stay at the fire dept. But we need more billets to safely and properly man all apparatus.

Fully staff fire pumpers. Increase manning to run the ambulance.

The Marine Corps should pay for the people that ride and enjoy providing the service of the ambulance. The people aboard this base need and deserve the quality of care that we can and do give them. Suggestion: keep the ambulance and make the people that want and enjoy it GS-6 and let them ride the ambulance fulltime.

Need more billets, more manpower, at least 4 more.

It is poor management to disable or restrict the full manning requirements of engine and truck companies to also man ambulances. All of these units are critical to the fire service and to those we are supposed to be helping. More with less in the fire service will only get more people hurt of killed, and less productivity accomplished.

Need more billets to bring manning level up.

Insufficient personnel in order to operate ambulance/fire-fighting services. As a result, there should be more personnel on duty to man every piece of apparatus to operate the department effectively and efficiently.

Manpower is reduced each time the ambulance crew leaves the station, even more so when they (ambulance crew) have to transport to the hospital. More manpower is definitely needed. From the onset, manpower on ambulances could or should have been on voluntary basis, this way your better EMTs would have been weeded out.

I believe the ambulance should be manned with permanent crews who are thoroughly trained (upgrades would come with positions).

Manpower should be allowed in manning levels to include personnel to cover ambulances and fire apparatus. This is an entirely different job, crews should not be expected to do collateral duties of this type. Which job do you do on the scene? Do you use your personnel as firefighters or EMS?

MCLB Barstow

I believe the engine and ambulance company should have a total of 6 personnel, 4 on engine, and 2 on ambulance.

I think the ambulance program is a very good program and should be kept.

Cross-manning only with 5 members per company (3 on engine, 2 on ambulance) and/or increase automatic assistance with regional agencies. Regionalize services with local agency (or agencies) to insure safe response and operations at fires, rescues or EMS incidents. I support “no boundary” sharing of apparatus to cover areas/regions and be more cost-effective, safe and still provide fire, rescue and EMS services, which is not only at a quality level and cost effective.

Not sure.

Separation of the crew is not healthy. Anything can or could happen on the fireground.

To include additional personnel for cross-staffing. Example: Engine company: 3-4/Ambulance: 2. Total crew of 5-6 men instead of 4.

I believe that the fire dept. should be 100% responsible for the ambulance with no intervention from the Navy! Due to protocol issues.

Due to ambulance response times, an engine company can be staffed by only 2 persons for up to an hour. This is not a very safe function. I think a good compromise would be to have an additional fire fighter so the engine could run with at least 3 persons until the ambulance was back in response area. Also we should have full control of EMS on base, Navy EMS and local protocols don’t mix well.

This is another way they are using to save jobs. If they are promoted to driving the ambulance, then they should drive the ambulance, and not the fire engine. Captains should ride the ambulance, so they can gain some experience.

We should be able to hire more personnel so we can have a four-man engine company and a two-man ambulance, so when the ambulance is transporting a patient, we will still have a full crew on the engine.

We teach and preach crews that they stay together are safer than crews that split up. L.A. City discovered that very same thing when they lost Capt. Dupey. With the 2-in and 2-out, this is even more so critical. In no way am I against providing ambulance service, but I am concerned when I see other departments reducing to 3 "on" an engine and the capability is less than with 4 on an engine. What needs to be done is hire personnel to properly staff all equipment that would be considered as 1st run and would or does directly provide services to those we serve and protect.

The fire dept. provides far better quality medical care than the corpsman. The corpsman had inadequate experience to treat patients out in the field, which lead to poor patient care. Fire fighters are trained for treating patients in the field or outside a clinical setting. Fire fighters are trained on local protocols. The corpsman are trained on a national registry, which makes it difficult when the corpsman transported patients to local hospitals. For the people that work on base, the fire dept. needs to keep the ambulance.

Personnel should be upgraded to GS-06 and above. There should be compensation for taking on the additional responsibilities and duties.

All ambulance staffing should be GS-6.

I feel the ambulance personnel should all be GS-6s.

I believe we the fire dept. provide better emergency care than the base dispensary. We should have full control of all medical emergencies without military police intervention. We should have the authority to order medical air ships when the criteria demands. We should be financially compensated for our training in the medical field and the services we provide. We should also provide paramedic services or advanced medical services.

There should be two people on the ambulance and four on the engine.

I believe that cross-manning the ambulance breaks down crew integrity (i.e. follow-ups to hospital).

To provide a better EMS role. EMT "D", medic or "extended scope" levels of certification should be attained. Especially at stations with greater distances to hospitals providing emergency care (i.e. F.A.Q. "Why wasn't an I.V. started for this pt.?! Asked by Drs. on duty at Barstow Comm. Hospital to our fire fighters, especially from the Yermo annex station – approx. 20-minute ride.)

I think it's a good start on the program, but it could get better for everyone. Like EMT-D, Medic program or EMT II. More money for us taking on more responsibility of this program even if we don't upgrade from EMT F/S (EMT Fire Service).

It would be beneficial to have one medic plus one EMT on the ambulance and four people on the engines at all times. This will stop the breaking up of the "4" man engines (i.e. during a medical aid the ambulance goes enroute to the hospital leaving only two people on the engine until the ambulance returns).

Additional duties without additional staffing is always playing a dangerous game, by assuming a higher risk factor. With OSHA's "2-in, 2-out" rule, all 4 members on each fire apparatus are going to be utilized on any significant fire where members are required to enter a hazardous atmosphere. Therefore, doesn't it make sense that by staffing an additional 2 positions on an ambulance, you enable the medical crew to assume their primary function of medical treatment on not only potential civilian fire causalities, but allow them to provide EMS services to our brothers entering that hazardous atmosphere if here is a fire fighter down situation. Also having those 2 additional people available allows them to further serve as an emergency back up or "rapid response rescue team." I would prefer to err on the side of safety. What is the value of 1 life worth?

MCAS Yuma

I think it should be received from the start. Sometime I have personnel are confused.

Main problem “manpower” – need to set new policies and research cross-man scope. It could work out, only time will tell. Corpsmen should do non-emergency transport.

I don’t think it makes any difference. I have pros and cons.

The ambulance is a good thing, but I would like to see the clinic do the general transports during normal working hours. When the ambulance is gone for a G.T., the loss of 2 personnel from the engine company is taken up by personnel from the truck/rescue company. If there is a fire while they are gone, it puts a greater need for the other fire fighters to do the job. Crash fire rescue provides support, but this takes time before they arrive.

Naval corpsman should take care of non-emergency transports.

Rewrite the SOP for base corpsman to do transport from the clinic during working hours if they keep unit for transport at base clinic, non-emergency!

Crew separation is caused by personnel transporting patients to the hospital. CFR backfills while they are gone, but sometimes personnel are not EMT trained leaving the dept. with insufficient manpower. I know the comments are brief but a possible solution is to increase personnel which will aid in the “two in, two out” theory and decrease the likelihood of any safety violations.

The fire dept. should have the ambulance all the time. The corpsmen are not experienced and don't do the jobs the way they are supposed to.

I believe better training should be implemented. A set policy should be set so that no 2 new EMTs should work the unit at the same time as it doesn't provide total patient care. The crews at night should be, or have 1 EMT with more than a year's experience.

The Marine Corps Fire Service should completely assume total responsibility for EMS onboard their stations/bases.

The ambulance should be for medical emergencies only. Fire fighters should be on the fire apparatus and respond to fire emergencies. If you cross-staff the apparatus, then efficiency and effectiveness is seriously compromised.

We just don't have enough people to do the job. Not enough training. Also, it never works having 2 different organizations in charge. I believe we take by ourselves, or not at all.

MCAGCC Twentynine Palms

The ambulances at MCAGCC 29 Palms have improved medical response times since they have been run by the fire dept. The fire dept. also provides more consistent quality of care to patients. In no way has the fire protection and emergency services missions been compromised. Having ambulances at the fire dept. and including all other services makes us very marketable.

I think we should have personnel assigned to the ambulance all the time and still have 4-person engine companies. If the ambulance is tied up at the hospital, we have to respond with only two persons on the engines to fires and other types of incidents which means we have to wait for other resources before going to work if it requires more personnel.

I believe that it would be nice to have more staffing to allow for a more flexible leave schedule but this is the only real benefit. Like I said, this is a nice to have not a need to have. The department's capabilities haven't been taxed by assuming control of the ambulance services and the services have improved throughout this facility with the consistency we provide.

Staff ambulances with a minimum of one medic (paramedic) and make those folks the same grade as a lead firefighter.

I think all Marine Corps Fire Depts. should have the ambulances. I think the people that are assigned on the ambulance should get a little more pay than the others.

They should be manned continually by dedicated positions. A four or five man company can't afford to wait at the scene of a structure fire with rescue, or a haz-mat with emergency decon, for their 2 fire fighters to get out, take their boots off, put pants on, put boots on, etc, ect. Also, when we are utilizing them for rescue/fire fighting/hazmat entry, etc., there is no one to rescue victims or our crewmembers.

I feel that the best level of care provided for the public comes from “in-house”. 80% of all calls are EMS related and it is important for the “mission” of the F.D. to provide professional EMS service and delivery. This is done best by cross-manning.

The quality of care that is provided by our dedicated professionals has improved 200% since the fire dept. assumed the ambulance service. I cannot recall one incident that has compromised the fire depts. mission.

It would be nice to have the extra personnel to man the ambulance. There have been times when there has been a delay of personnel arriving at emergencies when the ambulance and the truck have been apart (i.e. ambulance at hospital with a patient). The increase of personnel would also be greatly appreciated at hazardous materials emergencies when we always need extra personnel.

It works well here in my opinion.

Since we have acquired the ambulance, I have been on the EMS company. This has been in effect for over 5 years and I have never experienced a safety or mission compromise. If funds would allow, it would be nice to have dedicated staff rather than man it from an apparatus. But in today’s economy, I feel it is very efficient and practical.

It should be done on a base by base to see if it would help the Navy buy manpower and time response for quicker on-scene time for patient. Also, if they take it, it might have a pay incentive.

I believe that cross-staffing of the ambulance is beneficial in keeping personnel EMT skills and abilities proficient.

In the time that I have been here, at no time was the mission of the fire department compromised from cross-staffing the ambulance. I believe it is a valuable asset to the department and a need in today's fire service. The department is more effective and is seen helping and interacting with the base population more often.

I believe there is a potential for safety compromises due to cross-staffing. On our department however, I don't believe the risk is great enough to warrant changing the policy.

I believe that cross-staffing helps the fire department on scenes in enabling the control of the scene. Engine company and truck company officers have the handle on scene because they work with the cross-staffed personnel already. If they had an outside agency or even Naval Hospital personnel come in, the communication would not be as easy.

Cross-manning the ambulance is a positive way of supporting the mission of the Marine Corps without increasing the budget of the Marine Corps Fire Service.